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John Weale, London

Red, Blue, and Green Castles & Buildings

PRIZE DESIGN FOR A SET OF FARM BUILDINGS FOR A FARM OF 200 ACRES

PRIZE DESIGNS
FOR
COVERED HOMESTEADS,

ADAPTED TO
FARMS OF 200 AND 500 ACRES;

TOGETHER WITH AN
Introductory Essay
ON THE PRINCIPLES AND PRACTICAL MANAGEMENT OF
COVERED HOMESTEADS.

BY
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LAND AGENT, SURVEYOR, ETC.,

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Rotation which Modern Improvements have rendered advisable."

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PREFACE.

IN the year 1861, in consequence of the Yorkshire Agricultural Society having offered two Prizes for the best Plans for Farm Buildings, I was induced to prepare a design for a set of Farm Buildings adapted to a farm of 200 acres, and also a design adapted to a farm of 500 acres. To the former of these the prize was awarded, whilst the latter was "highly commended" by the judges.

For the purpose of publication, the smaller design has now been reduced to a scale of $\frac{1}{20}$ th of an inch to a foot, and the larger one to a scale of $\frac{1}{24}$ th of an inch to a foot. This difference in scale must be borne in mind, in comparing them with each other.

A full specification accompanies each design, and a bill of quantities is added, which will enable any local tradesman to estimate the cost, in reference to the price of materials in the district. Under ordinarily favourable circumstances, the smaller design may be executed for about 1000*l.*, and the larger one for about 2000*l.*

Many landlords are necessarily deterred from the erection

of well-designed, compact homesteads, by the existence of buildings which are too good to be sacrificed. The covered principle recommended in the following pages may, however, be adapted to existing buildings, to a much greater extent than would, at first sight, be supposed. In such cases a large and superfluous barn may sometimes be converted into a very fair make-shift for a covered yard, whilst a roof thrown across a space between two existing buildings will often effect a great improvement at a very small cost.

PHILIP D. TUCKETT.

76, OLD BROAD STREET, LONDON, E.C.,

June, 1862.

PRIZE DESIGNS FOR COVERED HOMESTEADS.

INTRODUCTORY REMARKS.

In preparing designs for Farm Buildings, there are three principal objects to be kept in view :—

1. Protection to Stock.
2. Efficient and Economic Manufacture of Manure.
3. Economy of Labour.

It requires but a very cursory inspection of the greater portion of our homesteads, to be convinced how entirely they fail to comply with these conditions. Many of them have been built without any design at all, each building having taken the place of some former one, with little or no reference to its neighbours ; but even where the homestead has been erected on a uniform plan, it too often happens that with greatly enhanced architectural effect, but little practical improvement is obtained.

How often do we see in newly built homesteads, two or three large yards, with costly walls, surrounded by several great barns, whilst a small cow-house and two or three narrow lean-to sheds, often exposed to the wind, afford the only protection to cattle ? Not unfrequently the yards slope down to an open ditch or pond, allowing the best portion of the manure to run off and be lost, whilst the rotten straw remains, like spent tea-leaves, to be carted out into the fields. Yet every modern farmer knows that without proper

buildings, it is impossible to make the most of the land ; that if you allow your stock to be exposed all winter to wind and rain, they will not only consume more food, but fail to thrive so well upon it, as when kept warm and dry ; whilst I can say from experience, that no one who has tried both, can have any doubt of the superiority of manure made under cover, over that which has been exposed for months to every shower.

A careful examination of the subject has fully satisfied me, that the protection of stock and economic manufacture of manure are best attained by covered yards ; and in advocating this principle, I am not proposing a merely theoretical or untried innovation, but a plan which has been thoroughly tested by experience, which has already been adopted by many of our best farmers, and, considering the obstacles which the permanent nature of buildings throws in the way of radical changes, is fast becoming popular. These homesteads can now scarcely be considered as uncommon, especially in the Eastern Counties ; they make converts wherever they are placed, and I think it is not too much to predict, that in a comparatively short time it will be the exception to build on the old plan.

I am glad to take this opportunity of acknowledging the kindness of Mr. Beadel of London and Chelmsford, in allowing me to inspect several of the homesteads built by him. Mr. Beadel has long been an advocate of this system, and has already erected between twenty and thirty covered homesteads in various parts of the country.

PROTECTION TO STOCK.

Science teaches us that a very large portion of the food eaten by an animal is consumed in keeping up the vital

heat, whilst only a comparatively small proportion is needed to replace the natural waste of the substance of the body. It follows from this, that the more cold the animal has to resist, the more food it will require ; and such we find is really the case. It is a very common remark amongst dairy farmers, that frosty weather makes the hay shrink, and every one knows that cattle consume most food in cold weather. But this is a very partial view of the case ; for the quantity of food that an animal can digest is limited, and if the whole of this is required for maintaining the heat of the body, and supplying its natural waste, none will remain to form flesh and fat, and the animal will not improve in condition. Thus the whole cost of the food is wasted, excepting only the value of the manure. On the other hand, if by keeping a beast warm and quiet, the quantity of food required for producing heat and supplying the waste of the body is reduced to a minimum, although less food will be consumed, yet far more will remain to be laid on in the form of flesh, and the animal will rapidly improve in condition. The same remark will apply to dairy cows ; cold weather or poor keep soon makes the yield of milk fall off.

These considerations very early convinced me that covered homesteads were well adapted for feeding beasts and dairy cows in the winter months ; but what I was most anxious to ascertain was, whether young stock, shut up all the winter, and turned out again in the spring, continued as hardy and did as well as those that had been wintered in straw yards. Having met with a considerable number of farmers who used covered homesteads, I am now able to speak with great confidence, when I say, that if wintered under cover and protected from the weather, but exposed to the atmosphere, as in the annexed designs (the covered yards being entirely open at one side), growing stock are more healthy, meet

with fewer casualties, and do better during the winter ; and when they go out in the spring, although the winter coat of hair, which is about to come off, may not be quite so thick, they are in every other respect as hardy, and certainly thrive as well, as those that have been wintered out of doors. This is a most important point ; for we constantly see steers and heifers permanently stunted, by starvation and exposure during their first and second winters in some straw yard, or in the fields.

On heavy land farms, great difficulty is found in feeding off root crops with sheep on the ground. It is, therefore, a common and increasing practice to grow a large breadth of mangold, and draw both it and the swedes off the land, to be consumed at home. Now it is the general experience that sheep pay better for feeding than cattle, and a covered homestead affords the means of fattening sheep to great advantage. A farmer who fats off 100 every winter under cover, told me the other day that he can fat twice as many sheep in his covered yard off an acre of swedes, as can be fed on the same quantity in the field. I have taken some pains to ascertain whether sheep kept on the straw, like cattle, are more liable to foot-rot than others, and I am assured that they are not, provided the litter is thoroughly well attended to, and not allowed to heat. But it is not so easy to prevent its heating under sheep as under cattle, and, therefore, the safest way is to put them on boards $2\frac{1}{2}$ inches wide, with spaces of $\frac{7}{8}$ of an inch between. In this way they thrive wonderfully. The boards are moveable, and the bottom and sides of the hollow space below should be concreted. The manure does not require emptying more than once in two or three months, some gypsum or loam being laid on the bottom and a little straw chaff occasionally sprinkled on the surface.

EFFICIENT AND ECONOMIC MANUFACTURE OF MANURE.

If all the food consumed in a farm yard consists of straw and hay, with a few turnips, it is even then desirable to protect and economise the manure ; but it is still more extravagant to incur a long cake-bill, or keep a lot of corn-fed beasts, and then allow the manure to be emptied daily from the stalls into an open yard, where it is soaked with rain, which in wet weather carries off much of the soluble portion, whilst a good deal of the ammonia is evaporated, leaving a large bulk of greatly impaired strength to be carted away. This is often the case, and yet farmers who winter-feed, know that it is as much as one can expect to get one's cake-bill covered by the increased value of the beasts, leaving all the profit to come out of the manure.

The loss that takes place in this way is far more than most people imagine, and the change effected in this respect by the covered system is one of the most important advantages, preventing, as it does, the waste both from washing and evaporation.

The covered yard is inclosed on three sides, but is entirely open on the south, and contains an area of 100 square feet for every full-sized beast it is intended to take ; thus a yard measuring 50 feet by 20 feet will take ten head of cattle.

The bottom is placed about 2 to 3 feet below the level of the ground, but slopes up to the side walls, and at the south, which is closed by an ordinary gate, it rises to the level of the ground outside, so as to allow of carts being backed in, when it is emptied.

No drainage is required.

When the cattle are brought in, in the fall of the year, a thin layer of straw is spread over the bottom, and more litter

is supplied daily, in just sufficient quantity to keep the beasts clean, and no more. This is, of course, thoroughly trodden down by the stock, and absorbs all the liquid manure, so that there is no waste from drainage.

This continues till the manure is about 3 feet deep, which, if the yard is kept full of stock, will be in from two to three months. It is then found to consist of a compact mass of thoroughly well-made dung, fit for carting straight to the field, without turning or exposure of any kind.

The whole secret of good management consists in the daily littering of the cattle, for if more straw be put down at once, than can be well trodden down and moistened, the manure will be unevenly made and liable to heat, but with ordinary attention to this point success is certain.

Persons often inquire whether the accumulated manure does not smell offensively, but the constant treading of the cattle keeps it so compact and impervious to the air, that WHILST UNDISTURBED it is perfectly sweet ; indeed, more so than in an ordinary yard. The decomposition goes on quite insensibly, and the volatile substances appear to be refixed as soon as they are formed, thus avoiding the waste that would otherwise take place.*

We find that twelve cart loads of manure made in this way

* It is well known that when a vegetable substance is wetted and pressed tightly down, so as to prevent the circulation of the air, it becomes sour ; a form of fermentation taking place which results in the production of lactic and other organic acids. In this way sour crout and Scotch sids are made, and grains are soured for pigs. If the damp cabbages used in making sour crout were allowed to lie loosely together, so that the air could gain admittance, they would quickly rot and smell intensely ; but being packed tightly in a barrel or pit, they turn sour. In the same way manure, lying loosely in an open yard, rots fast, and gives off much of its ammonia ; but when trodden tightly down in a small covered yard, it is almost impervious to the air, and organic acids are probably formed, which unite with and fix the ammonia as it is developed, forming soluble salts, and thus prevent its escape and keep the manure inodorous. In emptying such a yard, no sooner does the fork let in the air, than the smell is as astonishing as its absence was before.

form an ample dressing for an acre of roots, and produce better effects than a much larger number of ordinary dung.

We know a well authenticated instance of seven quarters of red and six of rough chaff white wheat being grown on a poor clay soil where this allowance had been used with the previous root crop. Indeed, as to the superiority and saving of manure, there can be no two opinions.

Lord Kinnaird gives a report of a comparative experiment in the Royal Agricultural Society's Journal, Vol. xiv., p. 336, with such astonishing results, that I abstain from quoting them, as it is obvious from the very large crops, that it was an exceptional case.

In the same journal, Vol. xviii., p. 368, is a comparative analysis by Professor Way, of manure made under cover and in open yards, communicated by Mr. Charles Lawrence. The quantity of water contained in each was the same, but that made under cover had about $3\frac{1}{2}$ times as much soluble organic matter, 15 per cent. more phosphoric acid, and $2\frac{1}{2}$ times as much alkalis, as that from the yard. The manure made under cover was composed of 41 per cent. of straw, and 59 per cent. of actual dung.

This experiment, and many others, tend to show, that in stating the value load for load, as double that of an average sample of manure made in open yards, I am not above the mark.

A given number of cattle will tread down considerably more straw in an open yard than under cover, and it is often supposed that a much greater bulk of manure is produced. But I believe, that owing to the great waste from washing and evaporation, and from decomposition carried to a wasteful point, this is not the case to nearly so great an extent as is imagined. It is very difficult to get any data for a calculation on this point.

Each bullock has trodden down about ten yards of solid

manure when a covered yard is full. This takes from two and a-half to three months, and we may therefore assume that in a covered yard you get full sixteen yards of manure per beast during the winter. The quantity of straw trodden down in an open yard varies greatly with the weather and other causes, but judging from the stock kept and the number of acres usually dressed with dung on various farms, I am inclined roughly to estimate the quantity of well-made manure from an open yard at about 24 cubic yards per beast, kept during the winter half of the year. The late Mr. Robert Baker, in his revised edition of "Bayldon on Tillages," states that the straw from one acre of corn produces about four loads (or six cubic yards) of manure; but it requires a large crop of straw to make this quantity. If we assume that half the arable land is in corn, and that each acre of corn produces only one and a-half loads of straw, we get three-fourths of a load of straw converted into three cubic yards of manure for every acre of arable land. This will hardly be done WELL in a straw yard with less than one beast to every eight acres of arable land. In a covered yard we find by experience that one load of straw, well trodden down, produces about four loads, or six cubic yards of manure. Let us, however, to be on the safe side, assume that three loads of straw are required to make the sixteen yards of manure.

Each beast winter-fed in a covered yard	{ converts 3 loads of straw into 16 cubic yards of manure, worth at 7s. per yard . }	£5 12
Each beast wintered in an open yard	{ converts 6 loads of straw into 24 cubic yards, at 3s. 6d. }	4 4
Saving in manure		1 8
Value of 3 loads of straw saved, at £1 . .		3 0
		<hr/> £4 8 <hr/>

Showing an actual waste in straw and manure of £4 8s. on each bullock winter-fed in an open yard. Does not this help to explain why there is usually so little profit on winter-feeding beasts ?

These figures are necessarily only approximations, it being extremely difficult to obtain any reliable data, especially as to open yards ; but I have endeavoured to check them by extended inquiry, and to avoid overstating the result.

The system of box-feeding is very similar to that of the covered homestead, but I think the latter has several advantages over it. The division into boxes entails some extra expense. The cattle being placed in yards inclosing 400 to 1000 square feet each, and only being tied up three times a day to receive their food, have room to move about, and to get just enough exercise to preserve their health, and not too much ; but where each is placed in a separate box, they have only just room to turn round. This distinction is particularly important in the case of young stock. If any of the manure is not perfectly well made, it is that in the corners, where it is not so much trodden ; in the yard this is a mere trifle, but in a box it amounts to a much larger proportion.

ECONOMY OF LABOUR.

This object is attained by the convenient arrangement of the several buildings with respect to each other, by general compactness of design, and by the introduction of steam power for threshing, grinding, chaff-cutting, &c.

But before saying more on these points, let us consider that much debated question, of the comparative advantages of fixed and portable steam engines. On the one hand may be urged a considerable diminution of wear and tear, and

some saving of fuel, but against these must be set the disadvantage of being obliged to bring all the corn into the barn to be threshed. And at the present juncture, when steam cultivation appears to be on the eve of coming into extensive use, I cannot overlook the consideration, that a farmer coming into an occupation of 500 acres, would in all probability purchase a 10 or 12 horse-power engine for general purposes, including steam cultivation, as well as threshing, &c. I therefore propose to provide in the larger design a building for the reception of such an engine, and shafting to connect it with the chaff-cutter, cake-crusher, and root-pulper, and also with a pair of stones for grinding soft corn and beans for cattle.

It may, however, be observed, that a fixed steam engine may, if preferred, be placed in the space allotted to the portable one.

Intimately connected with this subject is that of barn-room. Until the introduction of threshing machines, it was the fashion, as most of our old homesteads bear witness, whilst providing but scanty protection to the comparatively small head of cattle kept in those days, to expend a sum of money in building four or five enormous barns, which would, in some cases, have gone a long way towards purchasing the fee-simple of the farm.

Now I am fully convinced, that with our present facilities for threshing, the practice of bringing the corn into the barn in harvest time is a bad one, and this for two reasons: if, as is usually the case on a large farm, some of the fields lie at a distance from the buildings, much time and strength, which can ill be spared, are consumed in leading home the corn. This may be saved by field stacks, which can afterwards be threshed out upon the spot. The sheaves are generally fit to stack at least two or three days before they are dry

enough for the barn, and in unsettled weather this may make a serious difference. On the other hand, the barn saves the cost of thatching, and a few damaged sheaves in the roof of the stack, but these will be found, in comparison, very trifling items.

I therefore assume that a portable engine will either be used at the stack side, or the stacks will be brought into the barn as the corn is required, and I propose to provide one barn capable of holding from 100 to 150 quarters of corn in the straw, which will be enough for two or three days' threshing ; believing as I do, both for the above reasons and from observing the practice of some of our best farmers, especially in Lincolnshire, that the erection of more is an unprofitable outlay.

Turning now to the larger of the two designs, which is adapted for a farm of 500 acres, of which 300 to 400 are arable, it will be seen that it consists of a covered space 120 feet long by 72 feet wide, divided into yards for the reception of various descriptions of stock, separated from each other by concrete paths for feeding and other purposes, and inclosed by the other buildings.

These yards are marked with the number and kind of stock they will accommodate, and which are likely to be required ; but it is one of the advantages of the system, that once having the space covered over, by slight alterations of detail the several yards may be varied in size, and fitted up for whatever description of stock the special circumstances of each farm may suggest. I have placed the colts and growing cattle near the entrance, where they cannot be too warm, and can be more easily let out, while the calves'-pens are in the darkest, quietest and warmest corner. A piggery is provided for breeding sows, with open yards, as they do best so ; but fattening hogs will thrive well in one of the

yards or in the calf-pens, if no calves are kept. The stable dung may be thrown out daily into the adjoining yards, where it will be trodden down by the stock with the rest of the litter, but if preferred, it may be wheeled into the adjoining manure shed, into which the slight drainage from the piggeries is also conveyed ; an arrangement which secures perfect economy of manure, whilst it saves the expense and trouble of a liquid manure tank.

In these yards the labour of daily cleaning out stalls is saved, whilst on the other hand you have to tie up the beasts three times a day to feed, in order that each may get its own share of cake or meal. But they understand the object within a week, and after that, the time occupied in tying up is very trifling. Several loose boxes are provided, as they are always useful ; and a hospital or house for any animal that is ill, is placed quite out of the way of the other stock.

The feeding arrangements are so contrived, that the houses for roots and chaff, and the grinding-room, where the meal, crushed cake, and bruised oats will be, open close together, into a room where the roots are pulped and mixed with chaff and meal or cake, and a pump close by supplies the yards with water. If there be no well, the water from the roofs can be collected in a reservoir ; otherwise it is conveyed to the nearest pond.

The water supply is arranged with a tap to each trough, because we find that in the self-regulating plan of having all the troughs on the same level and connected with open pipes, the pipes almost always get stopped up with chaff, &c.

The room into which the portable engine is backed, has a concrete floor, with hollow places to fit the wheels, and a telescope chimney which draws down ; the ordinary chimney

lying in a horizontal position. The engine room is supplied with a pump and coal-store.

The engine is connected by a strap, with a shaft extending on both sides and placed far enough from it to prevent slipping. This drives an ordinary portable threshing machine, which is placed on the barn floor, the wheels fitting into hollows, which can be covered with iron plates in case two men thresh with flails, for which the floor is large enough. There is a corn room adjoining, into which the corn from the machine may be shot, to wait to be afterwards dressed and weighed up in the barn. The straw is raised by an elevator to the loft, which extends over the middle of the yards, and from which it is thrown down with ease into any of them. This loft will hold 60 to 70 loads of straw, the bay of the barn holding 70 to 80 loads. If more is threshed at one time, it can be pushed along to the other end and thrown down into waggons, but if several stacks are to be threshed at once the machine will probably be placed beside them in the stack yard. On the other hand, if straw is wanted when it is not convenient to thresh, it can be pitched up from a waggon into the south end of the loft. The straw loft also communicates with the room in which a chaff-cutter is worked by another strap from the shaft, and the cut chaff falls down into the chaff-room below. Beyond is a granary which can be locked up, and in front of the granary door is a trap-door and shoot for supplying cake and corn to the grinding-room underneath.

The grinding room communicates with the engine room, so that the same man can attend to the engine and to the mill. In this room three straps connect the shaft with a pair of millstones, an oat bruiser and a cake crusher.

Neither a chaise house and nag stable nor a dairy are included, because I think the former cannot be considered as

strictly farm buildings, but should be built apart and with reference to the position of the farm house, of which the dairy should form a part.

The smaller design is precisely similar in principle to the larger one, but more simple in construction, as the machinery is omitted. It is adapted for a farm of 200 acres, of which $\frac{2}{3}$ rds or $\frac{3}{4}$ ths are arable. The covered yards in the centre are 60 feet square, and if all appropriated to cattle, would accommodate at least 30 full-sized bullocks; but a small portion is shown as fitted up for sheep and calves. The turnip-cutting and chaff-houses adjoin each other, and are conveniently placed for the yards and stable. The straw for litter is thrown down through an opening from the loft, over the granary and root houses, where also a hand chaff-cutter may be used, the cut chaff falling into the chaff-room below. The bay of the barn will hold 35 or 40 loads of corn in the straw. Both floor and bays are asphalted, which will be found very convenient in dressing up corn, as well as in threshing. The other arrangements speak for themselves, and need no further explanation.

In conclusion, either homestead should be placed on the north side of the farm house, and the latter should be so arranged that one of the parlour windows commands a full view of the open or south side.

DESIGN FOR A

COVERED HOMESTEAD

FOR A FARM OF 500 ACRES.

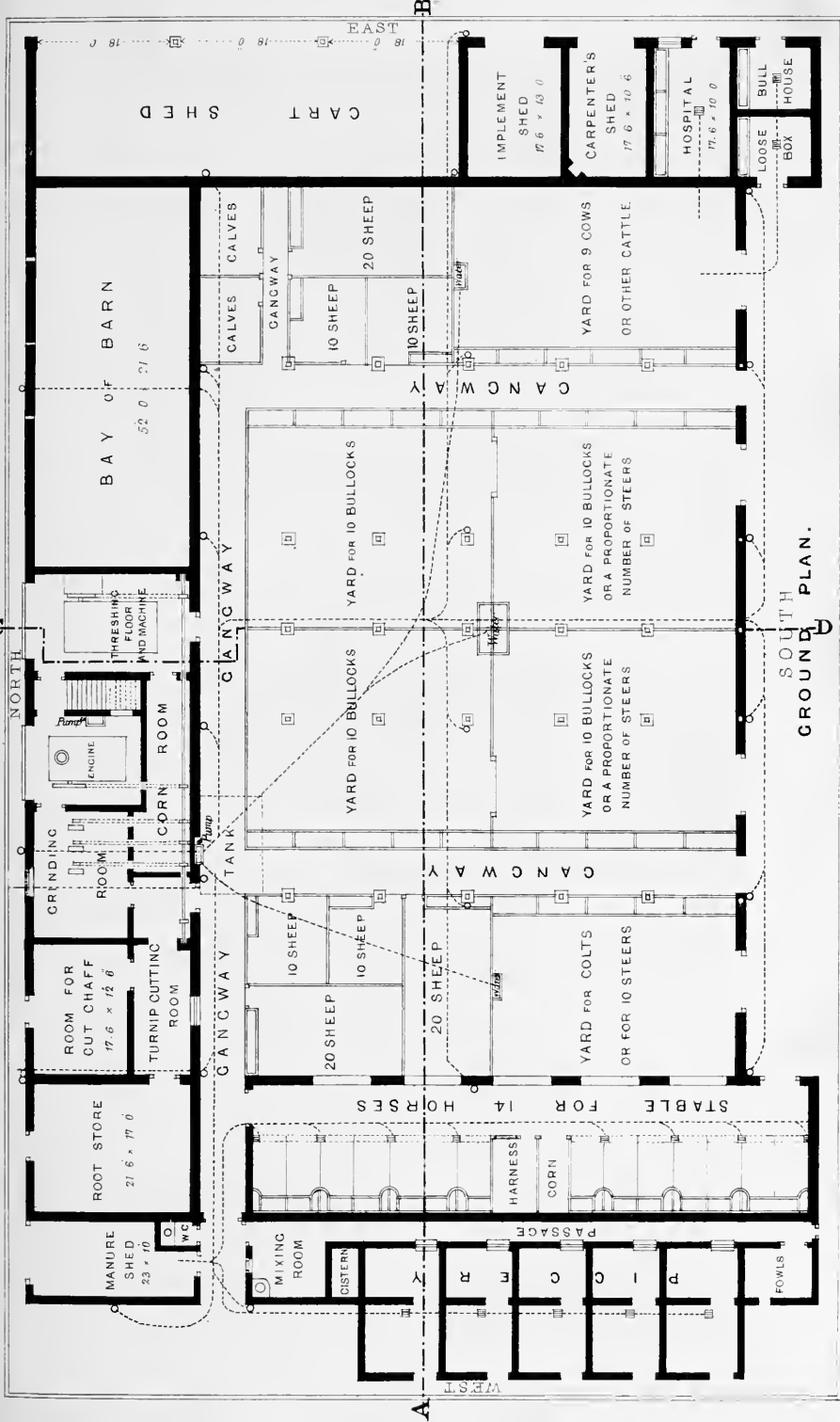
SCALE—24 FEET TO AN INCH.





John Weale London

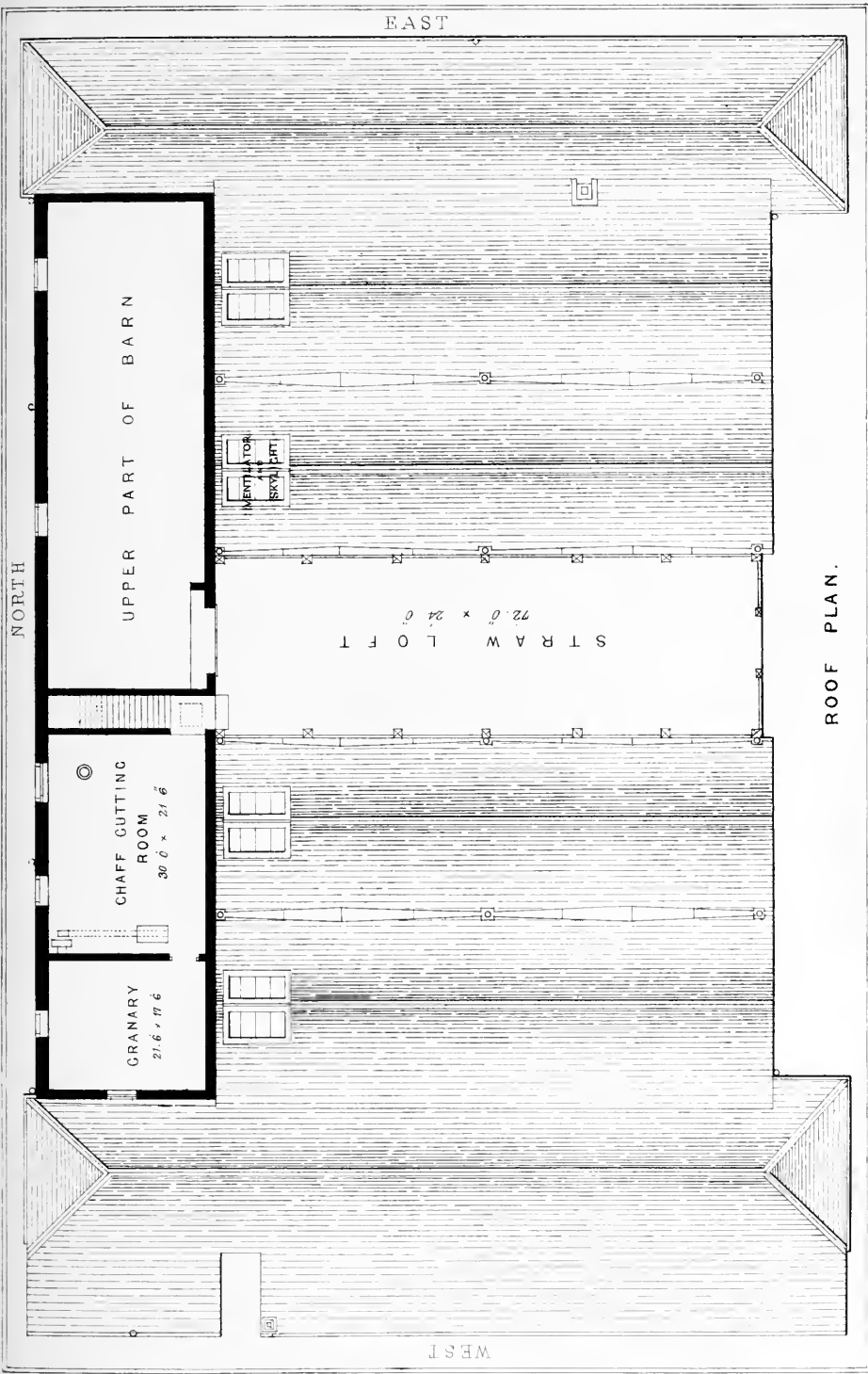
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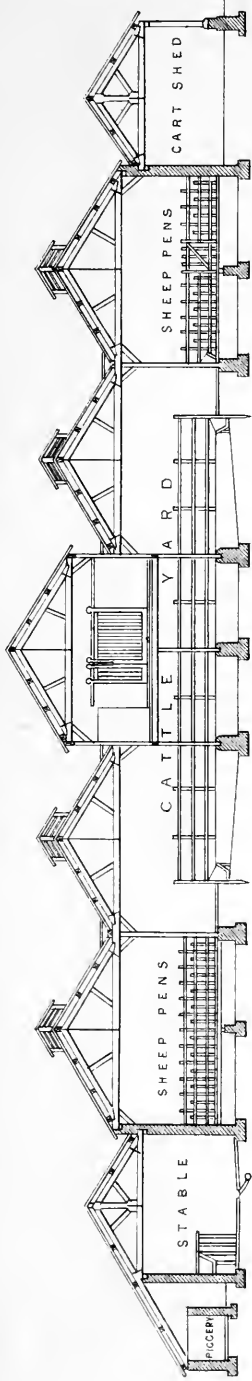
Will. Bro's Ltd. & Castle St. Holborn.

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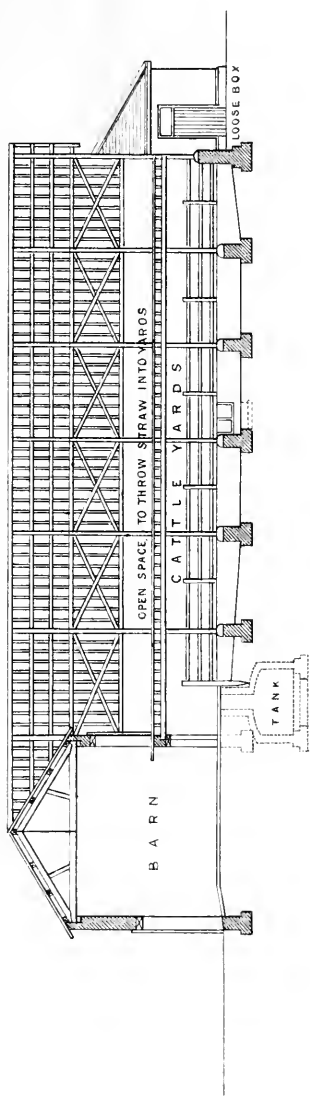




ROOF PLAN.

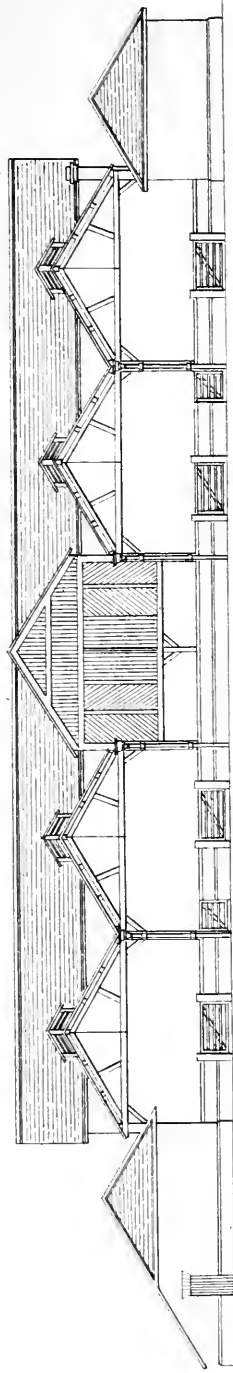


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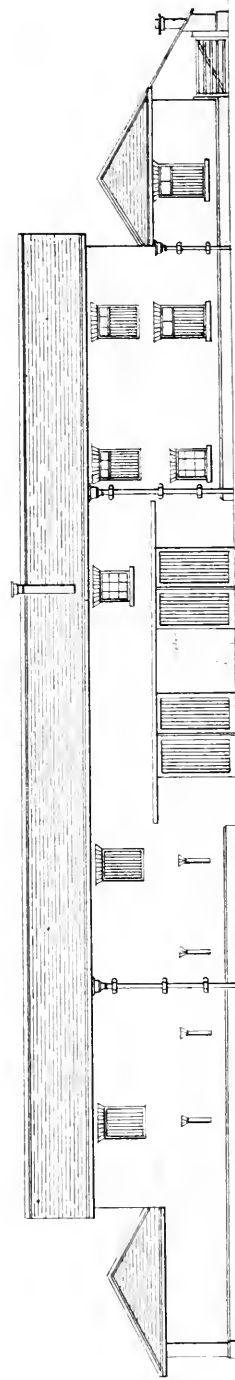


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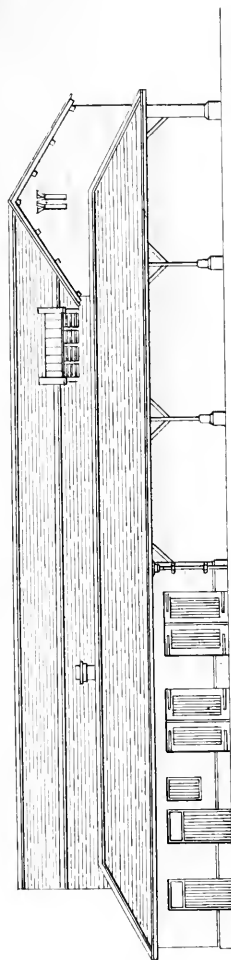




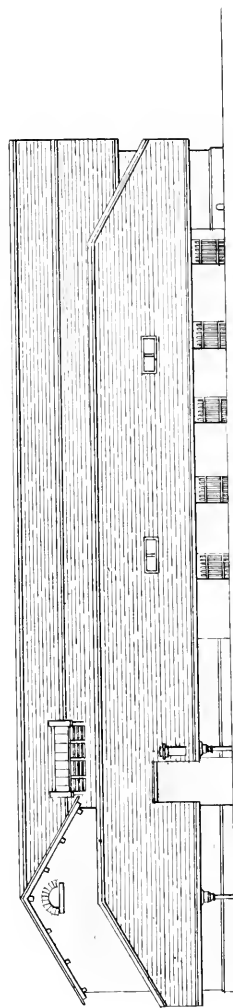
SOUTH ELEVATION.



NORTH ELEVATION.



EAST ELEVATION.



WEST ELEVATION.



*Specification of the several Works required in the Erection
of a Covered Homestead for a Farm of 500 Acres,
according to the accompanying Design.*

EXCAVATOR.

Dig trenches to the necessary depth and width for the foundation of all walls ; fill in and well ram dry rubbish round same.

Excavate all drains shown on the plan, great care being taken to keep an uniform fall and depth ; and fill in and well ram the earth afterwards. Form the yards as shown by the sections and on the plan. Form the whole of the floors to receive pavings as hereafter described ; well ram and consolidate ground in waggon lodge, implement and manure sheds, root store and cattle yards. Excavate ground for swill cistern in mixing house, and properly ram and consolidate ground round same. Excavate and level up the ground round building, as shown on the sections. Excavate for rain-water tank as shown on plan.

BRICKLAYER.

The whole of the bricks used to be a good, hard, sound, well-burnt brick, of an uniform colour, and unless made 12 months before being used, to be well saturated with water. The bricks for coping to be circular, 14'' or 9'' diameter, according to the thickness of the wall. The mortar to be composed of lime of the best description, and clean, sharp sand, in the proportion of three of sand to one of lime, well mixed. The cement described to be used, to be the best Roman cement mixed in the proportion of two of cement to one of clean washed sand.

Carry up the various walls, &c., as shown on the drawings,

well bonded and laid in mortar as before described ; the whole of the joints to be well filled in and flushed with mortar and neatly pointed.

No four courses of brickwork to exceed 12" in height. The lime brought on the ground to be kept under an inclosed shed, so as not to be injured by the air, and not more mortar is to be made up at any time than is sufficient for the day's consumption.

Rake out and point brickwork with cement to lead flashings. The walls of yards and bay in barn to have a brick coping as before described, bedded in cement. Build piers in cement under storey posts.

Build half brick cesspools in cement, 9" \times 9" in clear, at bottom of all rain-water pipes.

Construct swill cistern in mixing house, as shown, 3 feet deep, walls 9" thick, the bottom to be formed of bricks laid flat, the sides and bottom to be rendered in cement.

Lay 4" glazed socket drain pipes, jointed with cement, to convey the rain-water from the roofs of the buildings. Also lay pipes as before described, to convey the urine, &c., from stables and piggery to the manure shed, and from hospital, loose-box, and bull-house to cattle yard ; the whole of the drain pipes to have all requisite bends, junctions, &c.

Pave the calves' pens, stable and pigstyes, hospital, loose box and bull house, with brick-on-edge grouted.

Relieving arches over all openings where required.

Splay bricks to plinth.

Build rainwater tank, of the depth and size shown on section and plan, of 9" brick set in cement, puddled with 18 inches of clay as the work proceeds ; the same to have 9" arch set in cement, with proper manhole and Yorkshire stone cover to same, with lift-up ring and curb.

Build 9" dwarf walls to support flooring of sheep-pens.

Provide and fix boiler in mixing house, and stove in carpenter's shop.

MASON.

Provide and fix proper hook-stones to doors of implement shed and carpenter's shop, small front gates of yard, gates of piggery yards, and swivel doors over pig troughs ; solid tooled York stone bases to all storey-posts, morticed for posts ; York stone sills to all windows, and to all ordinary doors, and to the two small gates of front yard ; Yorkshire stone curb to sliding doors ; Yorkshire stone steps to chaff-room and granary ; and Yorkshire dishd-out grate-stones for iron gratings where required.

The barn, engine-room, corn, grinding, turnip-cutting and chaff-rooms, the gangways, mixing-rooms and passage, to have asphalte floors $1\frac{1}{2}$ " thick, properly laid.

Provide and fix two pump-troughs of 1" slate, $3' \times 2' \times 2'$; two tanks in cattle-yards of 1" slate, $3' \times 2' \times 2'$; and one ditto, $6' \times 4' \times 2'$, with iron stays and carefully cemented joints, as shown on plan.

Parget flues with cow-dung mortar.

The contractor is to find straw or other materials, and labour, for securing the work from the weather or damage, should it be considered by the surveyor necessary at any time so to do ; he is also to find all scaffolding necessary for the erection of the several works above described, and all other works required ; the same to be erected in a substantial and effectual manner to every part of the buildings, and shall from time to time be removed and secured, as the surveyor may require ; and when the whole of the works are completed, the contractor is to take down and remove the same from the ground at his own expense ; he is also to perform all chamfering, grooving, rebating, morticing or

other labour that may be required. To clean off and render complete and perfect the whole of the mason's work, immediately prior to the final rendering up of the works as complete. None of the work to be underlet or performed as task work.

CARPENTER AND JOINER.

The whole of the timber to be used, to be of the best Memel, Riga, Dantzic or red pine, of equal quality and free from all defects. The oak, of English growth, to be well seasoned and free from sap. The scantlings to be cut square and of the sizes stated below. All framings to be trussed and fixed in the best manner, with all requisite ironwork, bolts, &c., that may be required. All plates to be returned round all walls, and halved and spiked at angles. Provide and fix all requisite centering, turning pieces, &c. ; none of the centering to be removed until leave is given by the surveyor.

Provide and fix all requisite wood bricks for fixing joiner's work, &c., and templates under ends of all timber in walls.

Frame and fix the roofs with Memel timbers of the following scantlings, no timbers in roof or joists to be more than 15" from centre to centre.

Tie plates over storey posts	6"	× 4"
Tie beams	8"	× 4"
King posts	10"	× 4"
Ditto (over 20 feet span) of iron	1 $\frac{1}{4}$ " diameter.	
Principals	7"	× 4"
Strutts	4"	× 4"
Ridge	9"	× 1 $\frac{1}{2}$ "
Purlins	4"	× 4"
Pole plate	4"	× 3"
Ditto under gutters	8"	× 2 $\frac{1}{2}$ "
Hip and valley pieces	7"	× 2 $\frac{1}{2}$ "
Rafters	3 $\frac{1}{2}$ "	× 2 $\frac{1}{2}$ "
Storey posts, of oak	6"	× 6"
Strutts to ditto	4"	× 4"

1" gutter board and bearers, laid to proper currents, with rebated drips, cesspits, &c. Each pair of principals to have

all proper bolts and straps, &c. All joists to have herring-bone strainers where required, 8 feet apart.

Construct skylights, as shown on plan, with $1\frac{1}{2}$ " framed tops and 2" sides, filled in with 1" Louvre boarding with rolled capping on top for lead. Provide and fix two lay-to skylights over passage to pigstyes, $2' \times 3'$, and one ditto in roof of barn, $3' \times 3'$, in the position marked on plan.

The gables of the several buildings to be finished with a wrought rafter on cantilivers, as shown.

Lintels over all openings 18" longer than their respective openings, of the width and depth the walls require.

The breast-timber of waggon-shed to be of two pieces of Memel, $11'' \times 3''$, bolted together.

The floor of granary and chaff-cutting rooms to be of $1\frac{1}{4}$ " white deal, tongued with hoop iron.

The floor of straw-loft to be 1" white deal.

The joist to be $11'' \times 2\frac{1}{2}''$. The joists of straw-loft to rest on three beams notched into storey posts, $11'' \times 4''$. The sides of straw-loft to have trussed studding, as shown on section, with braces $4'' \times 4''$, and quartering $3'' \times 3''$, covered with 1" white deal weather boarding, nailed to same with edges lapping. The front of straw-loft to be formed as shown in elevation, the studding to have uprights $4'' \times 4''$, and quartering $3'' \times 3''$, filled in with 1" boarding, the opening in same to have a pair of 2" framed and braced folding doors, filled in with 1" tongued and beaded battens, hung to uprights with hook and band hinges, and secured with two iron barrel-bolts and proper hasp and staples. Sheep-pens to have a lattice floor of 1" boarding, $2\frac{1}{2}''$ wide, and $\frac{7}{8}''$ intervals, with proper ledges, made in pieces to lift out, so that the manure may be received in pits beneath, and resting upon beams laid 3 feet apart on dwarf walls. Provide and fix 17 racks in stable, loose-box, bull-house and

hospital, value 15s. each. Provide and fix mangers in stable, sheep and cattle yards, loose-box, bull-house and hospital, framed with 1" elm bottom, back, ends and divisions, and $1\frac{1}{4}$ " fronts rebated into grooved oak capping $4" \times 3"$, supported on proper oak manger-posts and bearers $5" \times 3"$, well rammed into ground, and not more than 5 feet apart. Fix proper rings into capping-rail of manger. Provide and hang in openings to piggery yards, five oak pale gates hung to hook-stones with strong hook-and-band hinges, and secured with hasps and staples.

Provide five cast-iron troughs to pigstyes, and fit up openings over same with protecting doors hung on swivels from hinge stones, as shown in details. Fence round yards, &c., as shown on plan, the fence to be 4 ft. above level of gangways and to have oak posts $6" \times 4"$ and 6 ft. apart, with rounded tops, and lower ends charred and set 3 feet into the solid earth, the same to have three triangular fir rails out of stuff $4" \times 4"$; all to be rough from the saw.

The sheep and calf pens to have a fence 4 feet high, with posts as before, with three horizontal rails, as before specified, and pales 3 feet high and 10" apart, the said pens to have nine cross-braced gates, with hook and band hinges, and proper hasps and staples.

Provide and hang two small gates, shown in front elevation. Provide and hang seven ordinary oak field gates, value 20s. each, with proper oak posts and hinges, to cattle yards and manure shed, where shown. The door frames and transoms to all ordinary doors to be $3" \times 4"$, wrought and rebated; the doors to same to be $1\frac{1}{4}$ " framed and ledged, with cross-garnet hinges and Norfolk latches. The barn, threshing-floor, the engine-house and the straw loft, to have sliding doors, as shown in details; the doors to be $2\frac{1}{2}$ " framed and braced, filled in with 1" tongued and double

beaded battens, in $4\frac{1}{2}$ " widths, with runners, ironwork, &c., complete, as shown. Provide and hang in openings to carpenter's shop and implement shed, 2" framed and braced folding doors, filled in with 1" tongued and beaded battens, hung to hinge stones with Collinge's patent hinges 30" long, secured with two 12" iron barrel bolts, and proper hasps and staples. The root store, the room for cut chaff, the granary and the chaff-cutting room, to have $1\frac{1}{2}$ " fixed sash over dwarf-framed doors, hung with strong garnet hinges to solid fir wrought and chamfered frames 4" \times 3". The hospital to have the hit-or-miss shutter window. The rest of the windows to be $1\frac{1}{2}$ " casements, in frames 3" \times 2". Form harness and corn rooms 8 feet high, with $1\frac{1}{4}$ " matched and beaded both sides boarding, housed at bottom into oak rough dressed, framed and stop-chamfered sill 5" \times 4", and at top into a similar capping 4" \times 3". Provide harness pegs against stable wall and round harness room.

Provide and fix on dwarf wall of tank in mixing house an oak rebated curb.

Cut away for, attend upon, and make good after all other trades.

SLATER.

Cover all roofs with duchess slating, nailed with zinc nails on red deal battens; the ridges to have proper slate ridge roll coming down 6" on each side, $2\frac{1}{2}$ " roll and $\frac{3}{4}$ " side. Verge slates set in cement where slate abuts against brick-work. All slates to be pointed inside.

PLUMBER, GLAZIER, PAINTER, &c.

Lay all gutters with 6lb. lead, the bottoms of the gutters to be 9" wide at the narrowest part, to have a fall of $1\frac{1}{2}$ " in 10 feet and 2" rebated drips, the sides to turn up at least 8" under the slates and 5" against walls. The aprons round

skylights and the valley pieces to be of 5lb. lead. All flashings to be of 4lb. lead, securely fastened to walls with proper wall hooks and cemented. Fix 4" semicircular iron shuting, on proper bearers 6 feet apart, to all eaves, and 3" down pipes with proper heads, where shown. Provide and fix two cast-iron barrel pumps with 2" lead suction pipe from tank, where shown. Provide and fix supply pipes from pump trough to tanks in cattle yards, of 1 $\frac{1}{4}$ " galvanised wrought iron lap welded tubing, with three brass taps. Provide cast-iron gratings where required. Glaze all windows with seconds Newcastle crown glass. Glaze skylights with Hartley's rough plate glass. Provide 4" shafting with driving drums and bearings, where shown.

The weather boarding on sides of straw loft to have two good coats of tar. Paint all the other external wood and iron work, and all doors and door and window frames, with four coats of good oil colour.

BILLS OF QUANTITIES OF HOMESTEAD FOR A FARM OF
500 ACRES.

Yds.	Rods	Feet		
EXCAVATOR, BRICKLAYER AND MASON.				
850			Cube	Digging in yards, foundations and tanks.
252			"	Brick in foundation.
6			"	Brick set in cement.
	46	123	Sup.	Reduced brick work.
		235	"	Reduced ditto, set in cement.
		130	"	9" brick arch, set in cement.
		40	"	4 $\frac{1}{2}$ " brick round manhole.
275			"	Brick-on-edge paving, grouted, and forming ground for same.
		26	"	Brick laid flat.
10			"	Cementing swill cistern.
39			"	Clay puddling.
495			"	Asphalte floor, 1 $\frac{1}{2}$ " thick.
		117	Run.	14" brick coping, set in cement.
		167	"	9" ditto ditto.
		103	"	Cut brick relieving arch.
		350	"	Splay bricks to plinth.
		76	"	Stone sill, 14" \times 9".
		40	"	Ditto 12" \times 6".

Rods Feet				EXCAVATOR, BRICKLAYER AND MASON— <i>continued.</i>
	60	Run.		Yorkshire-stone steps.
	820	„		Socketed glazed 4" pipes, and laying same.
	24	„		Pargetting flues.
				No. 25 brick cesspools, 9"×9", set in cement.
				No. 1 Yorkshire stone cover to man-hole, 2' 6"×2' 6", with ring and curb.
				No. 32 Yorkshire solid tooled bases, morticed to receive storey posts.
				No. 16 cast-iron gratings, on Yorkshire dishd-out grate stones.
				No. 8 hinge-stones to doors of implement shed, and carpenter's shop.
				No. 20 ditto to piggery gates and troughs.
				No. 4 ditto to small front gates of yards.
				No. 4 slate tanks 3'×2'×2' with iron stays and joints carefully cemented.
				No. 1 slate tanks, 6'×4'×2'.
				Provide and fix one boiler and one stove.
				Provide and fix 4" shafting, with drums and bearings, as shown.
				Ramming ground in waggon lodge, implement and manure sheds, root store and cattle yards.
Sq. Feet				CARPENTER AND JOINER.
	1922	Cube		Memel in roof timbers.
	82	„		Memel in lintels, templates and wood bricks.
	676	„		Memel in joists and bearers to floors of chaff-cutting room, straw loft and sheep-pens, and in studding of straw loft.
	141	„		Oak in storey posts and struts, and in posts of harness and corn-room partition, wrought four sides.
	155	„		Oak in manger-posts and bearers, and posts of yard fencing.
197	32	Sup.		Labour, laying rafters.
28	57	„		Ditto laying flooring joists.
11		„		Ditto fixing quartering and braces to sides and front of straw loft.
3	44	„		1 $\frac{1}{4}$ " matched and beaded both sides boarding to harness and corn-rooms.
10	21	„		1 $\frac{1}{4}$ " deal floor, tongued with hoop iron, to granary and chaff-cutting rooms.
17	76	„		1" deal floor to straw loft.
8	64	„		1" white deal weather boarding to sides of ditto.
2	31	„		1" front boarding to ditto.
12	40	„		1" flooring to sheep-pens, 2 $\frac{1}{2}$ " wide, with $\frac{7}{8}$ " intervals.
	656	„		Gutter-board and bearers.

Feet		CARPENTER AND JOINER— <i>continued.</i>
463	Sup.	1 $\frac{1}{4}$ " doors framed and ledged.
290	"	2 $\frac{1}{2}$ " framed and braced doors to barn, engine-house, and straw-loft, filled in with 1" tongued and double-beaded battens.
188	"	2" framed and braced doors to carpenter's shop, implement shed, and front of straw loft, filled in with 1" tongued and beaded battens.
37	"	1 $\frac{1}{2}$ " framed doors over pigs' troughs, as shown in details.
52	"	Oak pale gates to piggery yards.
78	"	Cross-braced oak gates to sheep and calves' pens.
28	"	Small oak gates in front of homestead.
380	"	1 $\frac{1}{2}$ " Skylight frames.
156	"	2" sides to ditto, filled in with 1" Louvre boarding.
72	"	1 $\frac{1}{2}$ " fixed sash.
32	"	1 $\frac{1}{2}$ " casements in frames, 3" \times 2".
14	"	Hit-or-miss 1 $\frac{1}{4}$ " shutter.
982	"	1" elm-bottom, back, ends and divisions to mangers.
427	"	1 $\frac{1}{4}$ " rebated elm fronts to ditto.
630	"	Palings 10" apart, the rails and posts being included elsewhere.
240	Run.	Herring-bone straners between joists.
1800	"	Fir sawn rails, out of stuff 4" \times 4".
433	"	Door-frame and transome, 3" \times 4".
30	"	Window-frame, 2" \times 4".
61	"	Oak capping and sill to barn doors, as shown in detail, 5" \times 6".
61	"	Iron runner to ditto.
300	"	Oak capping to mangers, 4" \times 3".
43	"	Oak, rough dressed, framed and stop-chamfered sill to harness and corn-room partition, 5" \times 4".
43	"	Oak capping to ditto, 4" \times 3".
7	"	Oak framed and rebated curb to tank, 9" \times 5".
15	"	Iron pigs' troughs, as shown in details.
Cwt.	Qr.	
11	1	Wrought iron in king posts. Labour and bolts to forty-six pairs of principals. Labour and $\frac{5}{8}$ th iron rods and bolts to breast timber of waggon lodge. Trim for skylights. No. 7 ordinary oak field gates. No. 14 oak posts for ditto. No. 14 harness pegs in stable No. 17 iron racks, value 15s. each No. 76 iron rings and staples to mangers. No. 12 wheels with iron straps, &c., to barn doors, as shown in detail. No. 4 pairs of Collinge's patent hinges.

CARPENTER AND JOINER—*continued.*

No. 25 hook-and-band hinges to sundry gates.
 No. 23 pairs of cross garnet hinges.
 No. 10 iron swivels to doors over pigs' troughs.
 No. 4 pairs of butts and screws.
 No. 26 hasps and staples to sundry gates and dwarf doors.
 No. 23 Norfolk latches.
 No. 6 12" iron barrel bolts.
 No. 2 proper casement fastenings.
 Provide and fix telescope chimney over threshing machine, as shown.

Sq. Feet

SLATER.

200 97 Sup. Duchess slating, laid on red deal battens with zinc nails, including pointing.
 88 Run. Verge slating set in cement.
 773 „ Rebated slate ridge roll.

Tons Cwt. Qrs. Lbs.

PLUMBER, &c.

3 17 2 18 Lead in gutters, valleys, flashings, &c.
 No. 2 cast-iron barrel pumps, with 32 feet of 2" suction pipe.

Yds. Feet

150 Run. 4" semicircular iron shuting, with bearers 6 feet apart.
 100 „ 3" down pipe.
 No. 25 heads to ditto.
 50 „ 1½" wrought iron tubing, supply-pipe.
 No. 3 brass taps to ditto.

GLAZIER.

69 Sup. Seconds Newcastle crown glass.
 288 „ Hartley's rough plate glass.

PAINTER.

500 „ Four coats oil colour.
 104 „ Tarring weather boarding.
 150 Run. Four coats oil colour to eaves gutters.
 100 „ Ditto to down pipes.

DESIGN FOR A
COVERED HOMESTEAD
FOR A FARM OF 200 ACRES.

SCALE—20 FEET TO AN INCH.

THE NEW YORK PUBLIC LIBRARY

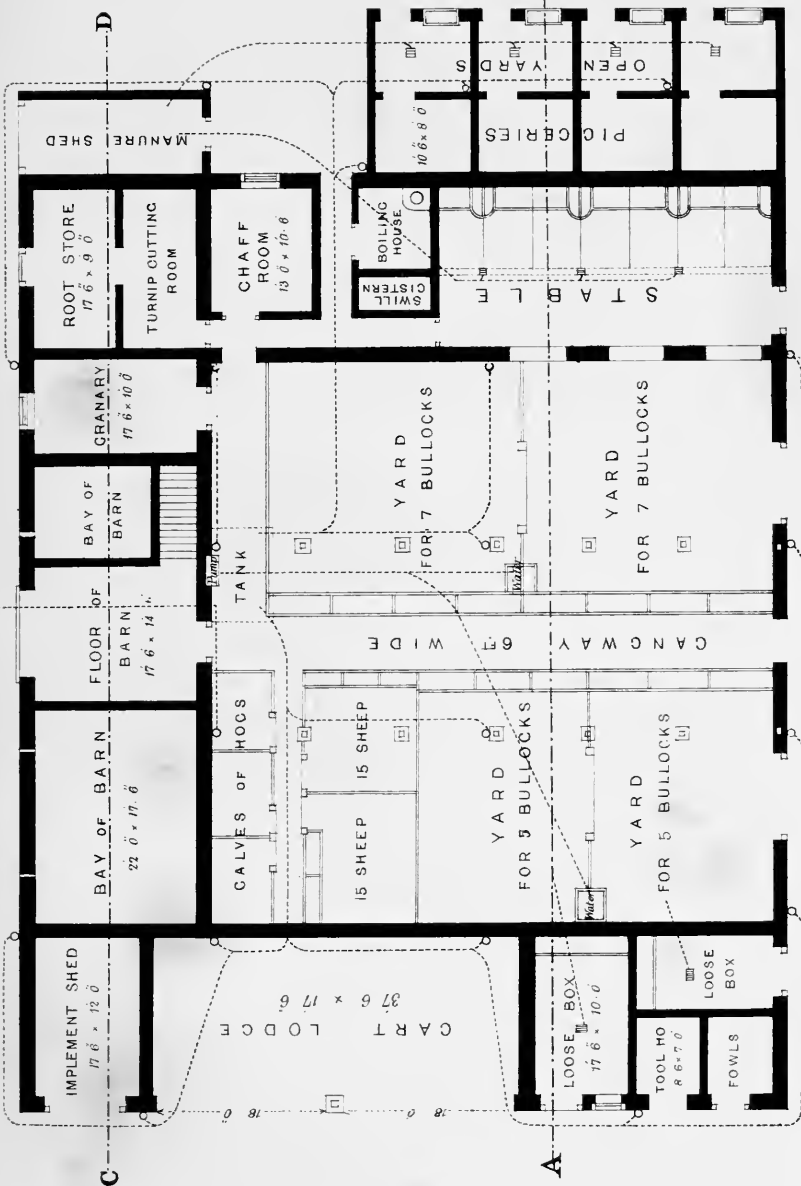
ASTOR LENOX TILDEN FOUNDATION

500 N. 5TH ST. N.Y.C.

NORTH

EAST

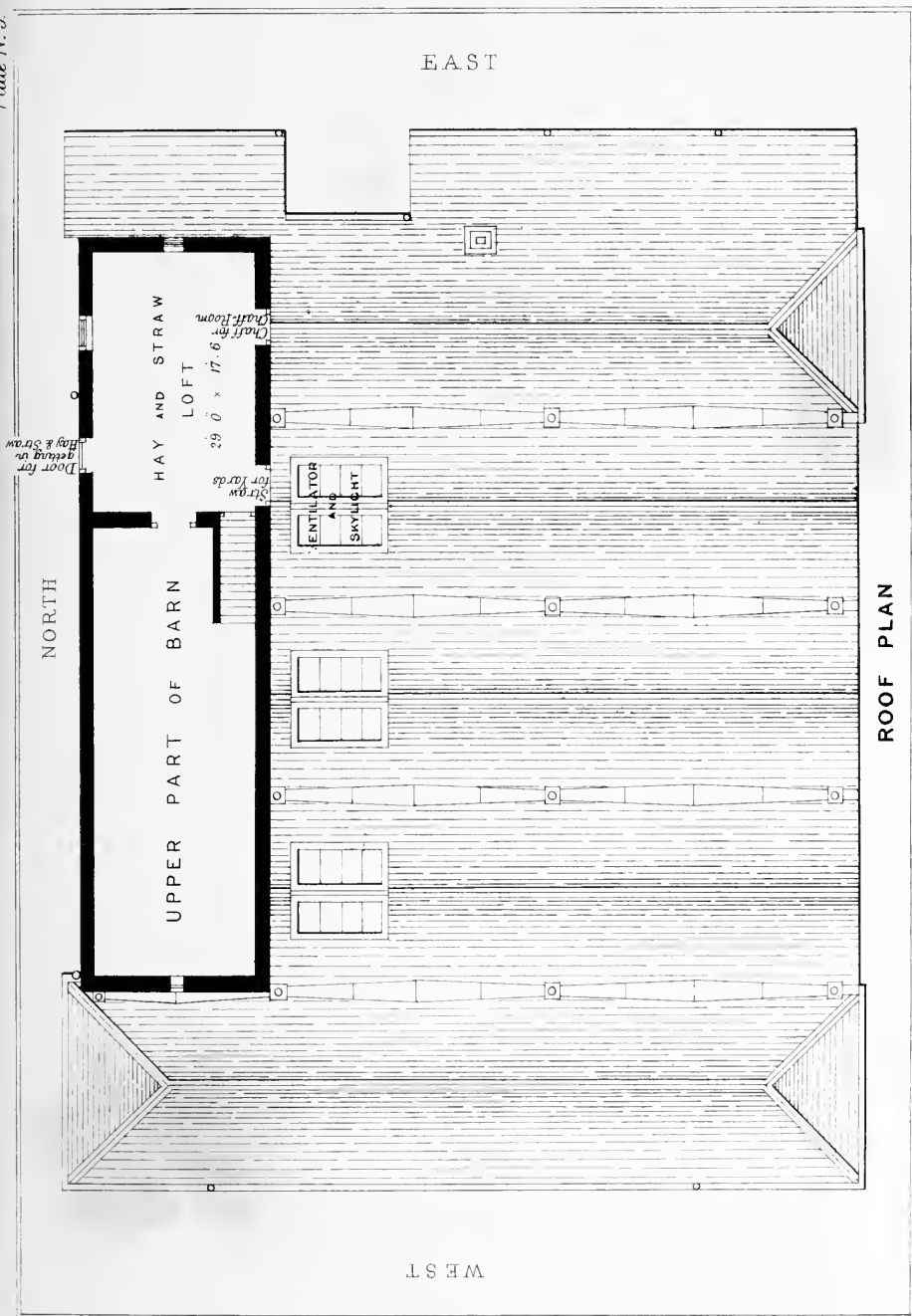
WEST



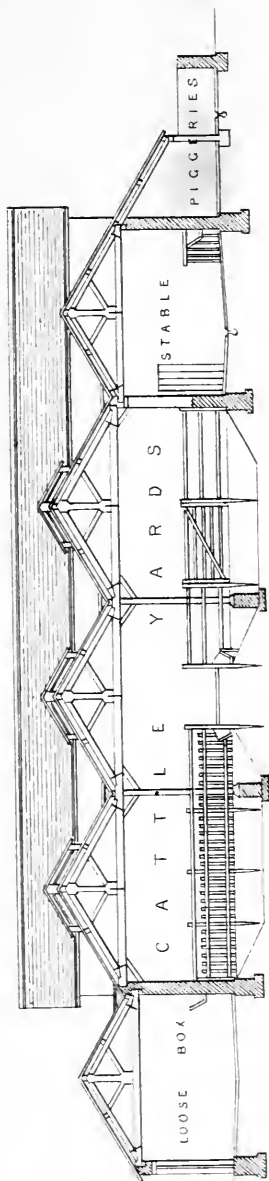
GROUND PLAN

John Weale, London.

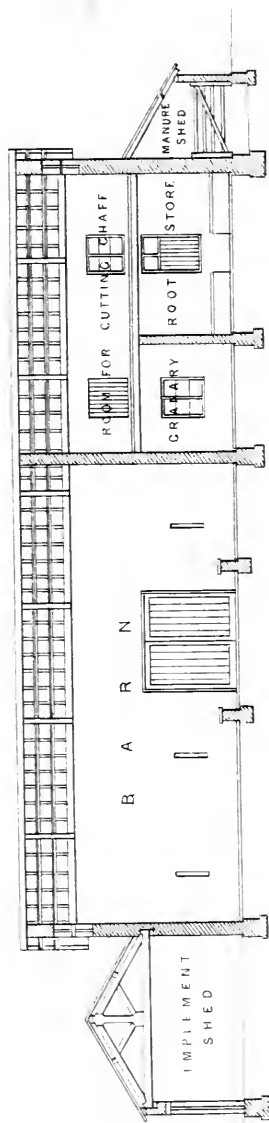
See 'The Little's Castle & Harbort'





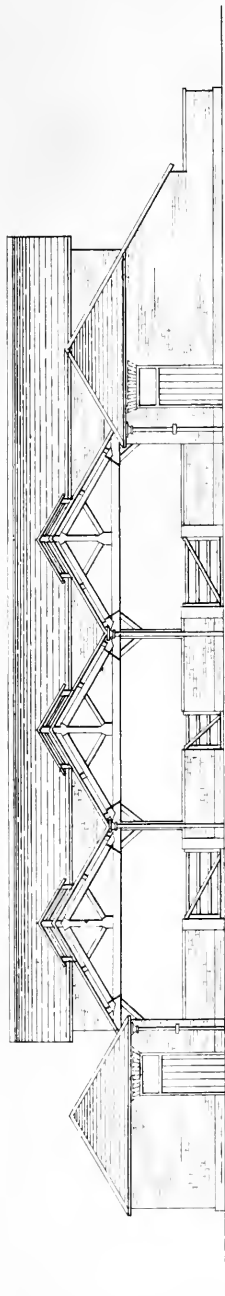


SECTION ON LINE A.B.

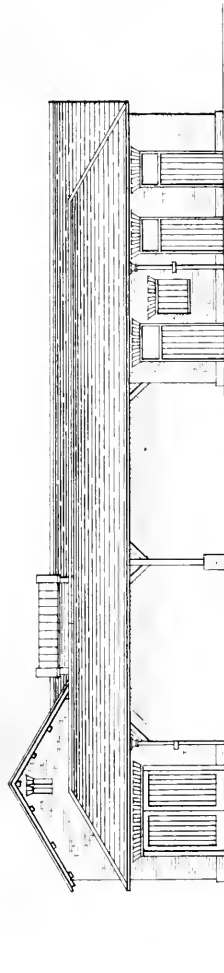


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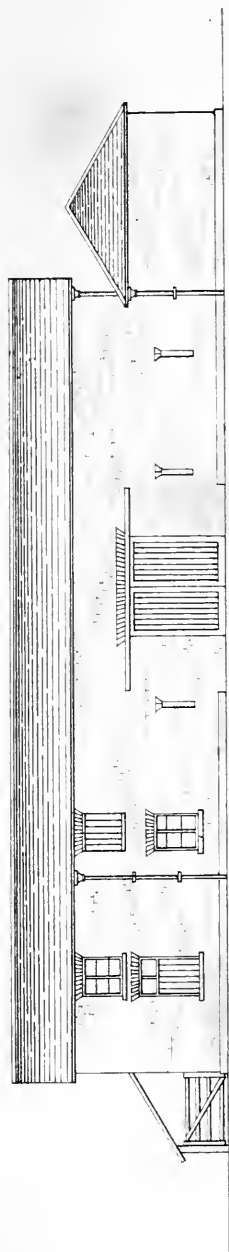


SOUTH ELEVATION

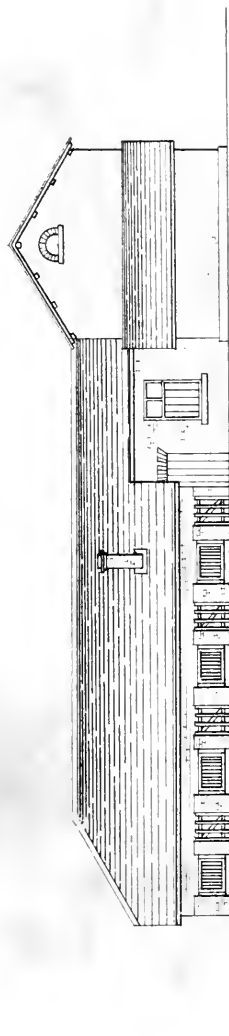


WEST ELEVATION





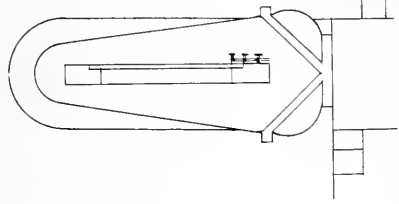
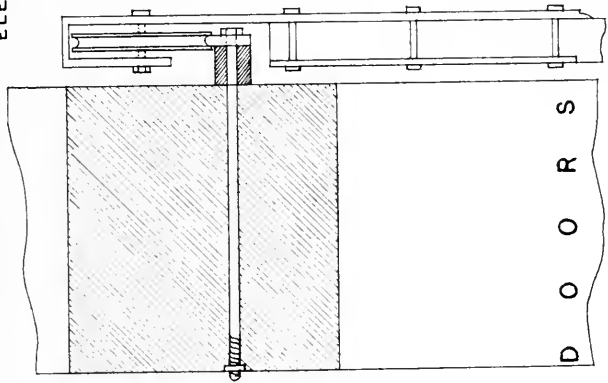
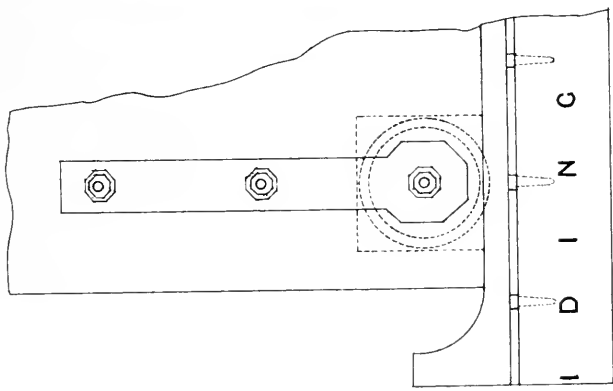
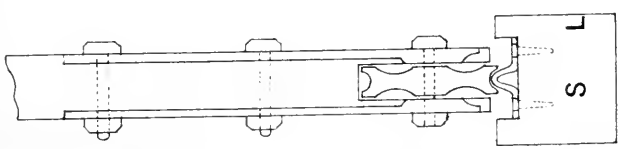
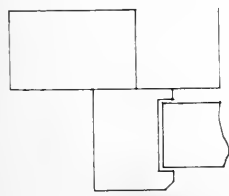
NORTH ELEVATION



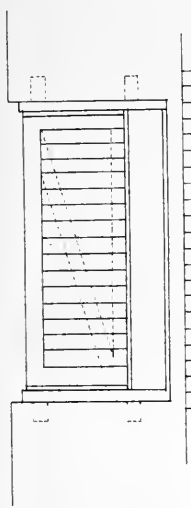
EAST ELEVATION



DETAILS



SECTION OF PICS TROUGH



ELEVATION OF PICS TROUGH

John Weale London

441, First Light Castle St. Hibernia



*Specification of the several Works required in the Erection
of a Homestead for a Farm of 200 Acres, according
to the accompanying Design.*

EXCAVATOR.

Dig trenches to the necessary depth and width for the foundations of all walls ; fill in and well ram dry rubbish round the same.

Excavate for all drains shown on the plan, great care being taken to keep an uniform fall and depth ; and fill in and well ram the earth afterwards. Form the yard, as shown by the sections and on the plan. Form the whole of the floors to receive pavings, as hereafter described ; well ram and consolidate ground in cart-lodge and cattle yards.

Excavate ground for swill cistern in mixing-house, and properly ram and consolidate ground round same.

Excavate and level up the ground round building, as shown on the section.

Excavate for rainwater tank, as shown on plan.

BRICKLAYER.

The whole of the bricks used to be a good, hard, sound, well-burnt brick, of an uniform colour, and, unless made twelve months before being used, to be well saturated with water. The bricks for copings to be circular, 14" or 9" diameter, according to the thickness of the wall. The mortar to be composed of lime of the best description, and clean sharp sand, in the proportion of three of sand to one of lime, well mixed.

The cement described to be used, to be the best Roman

cement, mixed in the proportion of two of cement to one of clean washed sand.

Carry up the various walls, &c., as shown on the drawings, well bonded and laid in mortar as before described, the whole of the joints to be well filled in and flushed with mortar and neatly pointed.

Rake out and point brickwork with cement to lead flashings. The walls of cattle yards, piggery yards, bays in barn, and swill cistern, to have a brick coping, as before described, bedded in cement. Build piers in cement under storey posts.

Build half-brick cesspools in cement, 9" \times 9" in clear, at bottom of all rainwater pipes.

Construct a swill cistern in mixing-house, as shown, 3 feet deep, walls 9" thick ; the bottom to be formed of bricks laid flat, the sides and bottom to be rendered in cement.

Lay 4" glazed socket drain-pipes, jointed with cement, to convey the rainwater from the roofs of the buildings. Also lay pipes, as before described, to convey the urine, &c., from stables and loose-boxes to central yards and manure shed ; the whole of the drain-pipes to have all requisite bends, junctions, &c.

No four courses of brickwork to exceed 12" in height. The lime brought on the ground to be kept under an inclosed shed, so as not to be injured by the air ; and not more mortar is to be made up at any time than is sufficient for the day's consumption.

Pave the calves' pens, stable, loose-boxes, pigstyes and pigstye yards, with brick-on-edge paving grouted.

Relieving arches over all openings where required. Splay-bricks to plinth. Build rainwater tank of the depth and size shown on section and plan, of 9" brick set in cement,

puddled with 18 inches of clay as the work proceeds ; the same to have 9" arch set in cement, with proper manhole and Yorkshire stone cover to same, with lift-up ring and stone curb. Build 9" dwarf walls to support flooring of sheep-pens.

Provide and fix boiler in mixing-house.

MASON.

Provide and fix proper hook stones to doors of implement shed, gates of piggeries, swivel doors over pigs' troughs, and centre front gate of yards. Solid tooled York stone bases to storey posts of roof and cart lodge, morticed for posts ; York stone sills to all windows, and to doors of root store and straw loft (sunk to receive proper frames) ; Yorkshire stone curb to sliding doors, Yorkshire stone steps to chaff room and granary, and Yorkshire dished-out grate stones for iron gratings in stable and loose boxes. The barn, granary, turnip-cutting and chaff rooms, mixing-house and gangways to have asphalte floors $1\frac{1}{2}$ " thick, properly laid. Provide and fix pump trough $3' \times 2' \times 2'$, and two tanks in cattle yards $4' \times 3' \times 2'$ of 1" slate with iron stays and carefully cemented joints, where shown on plan. Target flue of mixing-house with cow-dung mortar.

The contractor is to find straw or other materials and labour, for securing the work from the weather or damage, should it be considered by the surveyor necessary at any time so to do. He is also to find all scaffolding necessary for the erection of the several works above described, and all other works required, the same to be erected in a substantial and effectual manner, to every part of the buildings, and shall from time to time be removed and secured as the surveyor may require, and when the whole of the works are

completed, the contractor is to take down and remove the same from the ground at his own expense. He is also to perform all chamfering, grooving, rebating, morticing or other labour that may be required.

To clean off and render complete and perfect the whole of the masons' work, immediately prior to the final rendering up of the works as complete. None of the works to be underlet or performed as task work.

CARPENTER AND JOINER.

The whole of the timber to be used, to be of the best Memel, Riga, Dantzic or red pine, of equal quality and free from all defects. The oak of English growth, to be well seasoned and free from sap. The scantlings to be cut square, and of the sizes stated below. All framings to be trussed and fixed in the best manner, with all requisite iron work, bolts, &c., that may be required.

All plates to be returned round all walls and halved and spiked at angles. Provide and fix all requisite centering, turning pieces, &c.; none of the centering to be removed, until leave is given by the surveyor.

Provide and fix all requisite wood bricks for fixing joiners' work, &c., and templates under ends of all timber in walls.

Frame and fix the roofs with Memel timbers of the following scantlings; no timber in roof or joists to be more than 15" from centre to centre.

Tie plates over storey posts	.	.	6" × 4"
Tie beams	.	.	8" × 4"
King posts	.	.	10" × 4"
Principals	.	.	7" × 4"
Strutts	.	.	4" × 4"
Ridge	.	.	9" × 1½"
Purlins	.	.	4" × 4"
Pole plate	.	.	4" × 3"
Hip pieces	.	.	7" × 2½"
Storey posts, of oak	.	.	6" × 6"

Strutts to storey posts, of oak	4" × 4"
Gutter cheeks	8" × 2½"
Rafters	3½" × 2½"

1" gutter boards and bearers laid to proper currents, with rebated drips, cess-pits, &c.

Each pair of principals to have all proper bolts, straps, &c. The joists of hay and straw loft to have one row of herring-bone straners. Construct sky-lights as shown on plan, with 1½" framed tops, 2" sides filled in with 1" Louvre boarding, with rolled capping on top for lead. The gables of the several buildings to be finished with a wrought rafter on cantilivers as shown. Lintels of oak over all openings, 18" longer than their respective openings, of the width and depth the walls require.

The breast-timber of cart lodge to be of two pieces of Memel 11" × 3", bolted together. The floor of hay and straw loft to be of 1¼" white deal, tongued with hoop iron. The joists to be 11" × 2". The sheep-pens to have a lattice floor of 1" boarding, 2½" wide with 7⁄8" intervals, with proper ledges, made in pieces to lift out, so that the manure may be received in pits beneath, and resting on bearers 5" × 2", laid 3 feet apart on dwarf walls.

Provide and fix 7 iron racks in stable, value 15s. each. Provide and fix mangers in stable and yards, 1'6" wide at top, 1' wide at bottom and 1'6" deep, framed with 1" elm bottom, back, ends and divisions, and 1¼" front rebated into grooved oak capping 4" × 3", supported on proper oak manger posts and bearers 5" × 3", well rammed into ground and not more than 5 feet apart. Fix proper rings into capping rail of mangers. Provide and hang in openings to piggery yards 4 oak pale gates, as shown in details, hung to hook stones with strong hook and band hinges, and secured with hasps and staples.

Provide four cast-iron troughs to pigstyes, and fit up openings over same with protecting doors, hung on swivels to hinge stones. Fence round yards as shown on plan, the fence to be 4-ft. high above level of gangways; the said fence to have oak posts 6" \times 4" and 6-ft. apart, with rounded tops and lower ends charred, set 3-ft. into the solid earth; the same to have three triangular fir rails out of stuff 4" \times 4", all to be rough from the saw.

The sheep and calf pens to have a fence 4-ft. high with posts as before, with three horizontal rails as before specified, and pales 3 ft. high and 10" apart; the said pens to have five cross-braced gates with hook and band hinges. Provide and hang small gates shown in front elevation. Provide and hang 5 ordinary oak field gates, value 20s. each, with proper oak post and hinges, where shown. The door frames and transoms to all ordinary doors to be 3" \times 4" wrought and rebated; the doors to same to be 1 $\frac{1}{4}$ " framed and ledged, with cross garnet-hinges and Norfolk latches. The barn threshing floor to have sliding doors as shown in details; the doors to be 2 $\frac{1}{2}$ " framed and braced, filled in with 1" tongued and double-beaded battens in 4 $\frac{1}{2}$ " widths, with runners, ironwork, &c., complete as shown. The implement shed to have 2" framed and braced folding doors, filled in with 1" tongued and beaded battens, hung to hinge stones with Collinge's patent hinges 30" long, and secured with two 12" iron barrel bolts and proper hasps and staples. The root store and the room for cut chaff to have 1 $\frac{1}{2}$ " fixed sash over dwarf-framed doors, hung with strong garnet-hinges to solid fir wrought and chamfered frames 4" \times 3." The loose-box to have the hit-or-miss-shutter window shown on detail; the windows of granary and hay and straw loft, 1 $\frac{1}{2}$ " casements in frames 3" \times 2."

Provide and fix harness pegs against wall of stable;

provide and fix on dwarf wall of tank in mixing-house an oak rebated curb.

Cut away for, attend upon and make good after all other trades.

SLATER.

Cover all roofs with Duchess slating, nailed with zinc nails on red deal battens, the ridges to have proper slate ridge roll, coming down 6" on each side ($2\frac{1}{2}$ " roll and $\frac{3}{4}$ " sides), all slate to be pointed inside, and verge slates set in cement where slate abuts against brickwork.

PLUMBER, GLAZIER, PAINTER, &c.

Lay all gutters with 6lb. lead, the bottoms of the gutters to be 9" wide in the narrowest part, to have a fall of $1\frac{1}{2}$ " in 10' and 2" rebated drips, the sides to turn up at least 8" under the slates and 5" against walls. The aprons round skylights to be of 5lb. lead. All flashings to be of 4lb. lead, securely fastened to walls with proper wall-hooks and cemented. Fix 4" semicircular iron shutting, on proper bearers 6-ft. apart, to all eaves, and 3" down pipes with proper heads where shown. Provide and fix one cast-iron barrel pump with 2" lead suction pipe from rainwater tank, where shown.

Provide and fix supply-pipes from pump trough to tanks in cattle yard, of $1\frac{1}{4}$ " galvanized wrought-iron lap-welded tubing, with two brass taps. Provide cast-iron gratings where required. Glaze all windows with seconds Newcastle crown glass. Glaze sky-light with Hartley's rough plate glass. Paint all external woodwork and ironwork, and all doors and door and window frames, with four coats of good oil colour.

BILLS OF QUANTITIES OF HOMESTEAD FOR 200 ACRES.

Yds.	Rods	Feet	
EXCAVATOR, BRICKLAYER AND MASON.			
433		Cube	Digging in yards, foundations and tanks.
160		"	Brick in foundation.
3		"	Brick set in cement.
	31	228 Sup.	Reduced brick work.
		170 "	Ditto set in cement.
		90 "	9" brick arch, ditto.
		40 "	4½" bricks round manhole.
199		"	Brick on edge paving, and forming ground for same.
239		"	Asphalte floor.
	21	"	Brick laid flat.
9		"	Cementing swill cistern.
28		"	Clay puddling.
	54	Run.	14" brick coping.
	75	"	9" brick coping.
	70	"	Cut brick relieving arch.
	208	"	Splay bricks to plinth.
	31	"	Stone sill, 14" × 9".
	20	"	Ditto 12" × 6".
	12	"	Pargetting flue.
	52	"	Yorkshire stone steps.
	690	"	Socketed glazed 4" pipe and laying same.
			No. 17 brick cesspools 9" × 9" set in cement.
			No. 1 Yorkshire stone cover to manhole, 2' 6" × 2' 6", with ring and curb.
			No. 3 slate tanks 3' × 2' × 2', with iron stays and joints carefully cemented.
			No. 13 Yorkshire tooled bases, morticed to receive storey posts.
			No. 9 grates on Yorkshire dished out stones.
			No. 4 hinge-stones to doors of implement shed.
			No. 18 ditto to piggery gates and troughs, and front gate of yard.
			Provide and fix one boiler.
			Ramming ground in cart lodge and cattle yards.
	Sq.	Feet	
CARPENTER AND JOINER.			
	1040	Cube	Memel in roof timbers.
	50	"	Memel in lintels, templates and wood bricks.
	75	"	Memel in joists and bearers to floors of hay and straw-loft and sheep-pens.
	49	"	Oak in storey posts and struts, wrought four sides.
	77	"	Oak in manger posts and bearers, and posts of yard fencing.
100	24	p.	Labour laying rafters.

Sq.	Feet		CARPENTER AND JOINER— <i>continued.</i>
5	36	Sup.	Labour laying flooring joists.
5	7	,,	1 $\frac{1}{4}$ " deal floor, tongued with hoop iron.
	324	,,	1" flooring to sheep-pens, 2 $\frac{1}{2}$ " wide with $\frac{7}{8}$ " intervals.
	357	,,	Gutter-board and bearers.
	303	,,	1 $\frac{1}{4}$ " doors, framed and ledged.
	115	,,	2 $\frac{1}{2}$ " framed and braced barn doors, filled in with 1" tongued and double-beaded battens.
	72	,,	2" framed and braced doors to implement shed, filled in with 1" beaded battens.
	30	,,	1 $\frac{1}{2}$ " framed doors over pigs' troughs, as shown in detail.
	42	,,	Oak pale gates to pigstyes.
	26	,,	Cross-braced oak gates to sheep and calves' pens.
	14	,,	Small oak gate in front of homestead.
	284	,,	Skylight frames.
	117	,,	2" sides to skylights, filled in with 1" Louvre boarding.
	45	,,	1 $\frac{1}{2}$ " fixed sash.
	32	,,	1 $\frac{1}{2}$ " casements in frames 3" \times 2".
	14	,,	Hit-or-miss 1 $\frac{1}{4}$ " shutters.
	471	,,	1" elm bottom, back, ends and divisions to mangers.
	222	,,	1 $\frac{1}{4}$ " rebated elm fronts to ditto.
	360	,,	Paling 10" apart, the rails and posts being included elsewhere.
	29	Run.	Herring-bone strainers between joists.
	768	,,	Fir sawn rails out of stuff 4" \times 4".
	325	,,	Door-frame and transom, 4" \times 3".
	30	,,	Window-frame, 2" \times 4".
	21	,,	Oak capping to barn doors, as shown in detail, 5" \times 6".
	21	,,	Iron runner to ditto.
	148	,,	Oak capping to mangers, 4" \times 3".
	12	,,	Iron pigs' trough, as per drawing.
	7	,,	Oak rebated curb to swill cistern.
			Labour and bolts to twenty-nine pairs of principals.
			Labour and $\frac{5}{8}$ " iron rods and bolts to breast-timber of cart lodge.
			Trim for skylights.
			No. 5 ordinary oak field gates, 9' long.
			No. 10 oak posts to ditto.
			No. 7 harness pegs in stable.
			No. 7 iron racks, value 15s. each.
			No. 31 iron rings and staples to mangers.
			No. 4 wheels with iron straps &c. to barn-doors, as shown in detail.
			No. 2 pairs of Collinge's patent hinges.
			No. 6 pairs of hinges to yard gates.
			No. 4 ditto to pigstye gates.
			No. 15 pairs of cross garnet-hinges.

				CARPENTER AND JOINER— <i>continued.</i>
				No. 5 pairs of hook and band hinges to sheep and calves' pen gates.
				No. 4 pair 2½" butts and screws.
				No. 8 iron swivels to doors over pigs' troughs.
				No. 16 hasps and staples to sundry gates.
				No. 3 hasps and staples to dwarf doors.
				No. 12 Norfolk latches.
				No. 2 12" iron barrel bolts to doors of implement shed.
				No. 2 proper casement fastenings.
				SLATER.
				102 32 Sup. Duchess slate on red deal battens, with zinc nails, including pointing.
				108 Run. Verge slating set in cement.
				440 „ Rebated slate ridge roll.
Tons	Cwt.	Qrs.	Lbs.	PLUMBER, &c.
2	7	2	10	Lead in gutters, flashings, &c.
Yds.	Feet			
103			Run.	4" semicircular cast-iron eaves gutters, on bearers six feet apart.
57			„	3" cast-iron down pipe.
			„	No. 20 heads to ditto.
27			„	1¼" wrought-iron tubing.
				No. 1 cast-iron pump with six feet of 2" lead suction pipe, and fixing.
				GLAZIER.
				58 Sup. Seconds Newcastle crown glass.
				203 „ Hartley's rough plate glass.
				PAINTER.
282			Sup.	Four coats oil colour.
103			Run.	ditto to eaves gutters.
61			„	ditto down pipes.

DIRECTIONS TO BINDER.



PLATE No. 1, to face Title Page.

„ „ 2, 3, 4, 5, 6, and 7, to face Page 20.

„ „ 8, 9, 10, 11, 12, and 13, „ 34.

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 Interior of Abutment Walls
 View on Top of Roof showing Painting Traveller
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THE TEMPLE OF JUPITER PANHELLENIUS AT ÆGINA:—

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Vignette of Interior View of the Temple Plate

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5. Section through the Pronaos
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- 13 and 14. Ionic Order of the Interior
15. Details of the Central Column of the Interior
16. View of the Temple from the Road to Phigaleia, from the drawing of the Baron Stackelberg

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| <ol style="list-style-type: none"> 1. Peinture sur bois (Suisse), émaux (Allemagne), peinture de manuscrit, étoffe (Flandre), étoffe (Allemagne). 2. Détail des ornements de Perse. 3. Peinture de manuscrit, étoffe de vêtement, émail sur cuivre (Italie), étoffe de vêtement (peinture Allemagne). 4. Tapis de teinture Française. 5. Peinture (Angleterre), 15me siècle, teinture en cuir (France), peinture (France), fonde de tableau (Flandre). | <ol style="list-style-type: none"> 6. Cachet du Roi de Perse, détail des ornements du Prince Abbas-Mirzu. 7. Etoffe de vêtement (Allemagne), étoffe de tapis (do.). 8. Peinture murale antique (Grèce), peinture murale (Italie), mosaïque Arabe (Espagne), mosaïque Romaine, peinture Arabe. 9. Etoff. de vêtement, peinture de manuscrit, peinture sur verre—mail tous (Allemagne). 10. Ancien tapis de teinture Turc. 11. Peinture sur verre (Allemagne). |
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12. Peinture sur verre (Allemagne).		2. Etoffe (France)	17me. siècle.
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14. Etoffes (France)	17me. et 18me. do.	5. Cuir repoussé (France)	17me. et 18me. do.
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16. Broderies (France)	17me. et 18me. do.	7. Do. do.	17me. do.
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19. Broderies (France)	17me. et 18me. do.	10. Etoffe (France)	17me. et 18me. do.
20. Tapisserie (Chine)	15me. do.	11. Do. do.	18me. do.
1. Etoffe (France)	18me. do.	12. Do. (Turque)	17me. do.
		13. Do. (France)	17me. do.

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		33. Peintures, émaux, et étoffes.	
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